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EXAMINER

CHANG, SUNRAY

ART UNIT PAPER NUMBER

2121

DATE MAILED: 07/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/614,129

Applicant(s)

HIRAI, NORIO

Examiner

Sunray Chang

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>20060427</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in responsive to the paper filed on April 27th, 2006.

Claims 1 – 20 are presented for examination.

Claims 1 – 20 are rejected.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. **Claims 1 – 19 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Marion A. Keyes (U.S. P.G. Pub. No. 2004/0204775, and referred to as **Keyes** hereinafter) and in view of Alvin D. Toelle (U.S. Patent No. 4,173,205, and referred to as **Toelle** hereinafter).

Regarding independent claims 1 5, 6, 13, 16 – 18, and 19,

Keyes teaches, [for example, 0008, 0019 – 0020, 0022 – 0023, 0025 – 0033, and 0036 – 0039]

- An optimal operation controller of a plant [process control system ... to provide for better or more optimal control of the process and to provide a better understanding of the condition which lead to maximum profitability of the plant, Abstract] comprising:
- a correlation analyzing unit for obtaining correlation between a state of predetermined process and each of one or more operation elements based on an operation status of the plant to be controlled, [use the economic models to determine useful economic parameters or information associated with the actual operation of the process plant at the time the plant is operating, 0008]
- storing the correlation in a correlation table, [data collection related to the operating status of the devices, 0019] and
- computing operation efficiency for each operation element based on the operation status of the plant; [the economic models, which maybe stand along models or models integrated in other application, such as diagnostic or optimization applications, use this data, along with data from the process control system to determine profitability of the plant in an on-line manner, 0027] wherein
- said correlation analyzing unit uses data collected during a prior implementation of the predetermined process to compute the operation efficiency; [a process control system includes economic models disposed in communication with process control modules, as well as with sources of economic data, such as cost, throughput and profit data, and uses the economic models to determine useful economic parameters or information associated with

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the actual operation of the process plant at the time the plant is operating, The economic model can be used to provide financial statistics such as profitability, cost of manufactured product, etc. in real time based on the actual current operating state of the process and the business data associated with the finished product, raw materials, etc. These financial statistics can be used to drive alarms and alerts within the process network and be used as inputs to process plant optimizers, etc. to provide for better or more optimal control of the process and to provide a better understanding of the conditions which lead to maximum profitability of the plant, Abstract]

- a categorization efficiency table for storing the operation efficiency of the predetermined process computed by the correlation analyzing unit; [constructing models to accurately reflect the economic state of the process, 0037] and
- an optimal pattern searching unit for performing a look-up of [make decisions when controlling the operation of the plant ... search functions for the process, 0030; alter the operation of the process to make the process more profitable, 0037] the categorization efficiency table [economic models, 0008] based on data collected from the plant [actual operation of the process plant, 0008] during a subsequent implementation of the predetermined process [in real time based on the actual current operating state of the process ... and be used as inputs to process plant optimizers to provide for better or more optimal control of the process, 0008] in order to output an instruction to control each of the one or more operation elements during the subsequent implementation of the predetermined process without simulating an operation efficiency. [financial statistics can be used to drive alarms and alerts within the process network and be used as inputs to process plant optimizers, to

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provide for a better understanding of the condition which lead to maximum profitability of the plant. 0008; constructing models to accurately reflect the economic state of the process ... the model can be used to provide the number and the cost to be used to ... alter the operation, 0037].

Keyes does not clearly point out a look-up table of optimal values for outputting parameters to control a plant.

Toelle teaches a method with steps of preprogramming a memory with a look-up table of optimal values and reading out the optimal values for controlling the plant [Col. 4, Lines 4 – 29]

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **Keyes** to include "a look-up table of optimal values for outputting parameters to control a plant", for the purpose of completing a close-loop method of control capable of being accurately programmed for any desired set of operating conditions. [Col. 3, Lines 64 – 66]

Regarding dependent claim 2, 8, 10, 11,

The optimal operation controller of the plant of claim 1, wherein:

- the categorization efficiency table stores the operation efficiency for an operation element [device] and the operation efficiency of an entire plant [process plant], and the optimal pattern [efficiency numbers] searching unit controls the each element in consideration of the operation efficiency of the entire plant. [0008, 0032 and 0037]

Regarding dependent claim 3, 9, 14, 15

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The optimal operation controller of the plant of claim 1, wherein

- the correlation analyzing unit categorizes the correlation between the state of the predetermined process and each of the one or more operation elements into specific steps based on the data input from the plant to be controlled and writes the correlation in the correlation table. [use the economic models to determine useful economic parameters or information associated with the actual operation of the process plant at the time the plant is operating, 0008]

Regarding dependent claim 4,

The optimal operation controller of the plant of claim 3, wherein

- the categorization efficiency table stores data of an approximated curve generated by the categorized correlation, [Fig. 6, 7 and 9] and
- the optimal pattern searching unit outputs the instruction by referring to the data of the approximated curve. [determining how to change a process control scheme or configuration or what to fix within a process control plant, to obtain the most financial impact, 0109]

Regarding dependent claims 7 and 12,

The optimal operation controller of claim 6, wherein

- the plurality of operation elements are devices for configuring the plant during the predetermined process.

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3. **Claim 20 is rejected** under 35 U.S.C. 103(a) as being unpatentable over **Keyes** and in view of **Toelle**, further in view of Albert Robbat, Jr. (U.S. Patent No. 5,970,804 and referred to as **Robbat** hereinafter).

Regarding dependent claim20,

Keyes teaches an optimal operation controller of a plant [process control system ... to provide for better or more optimal control of the process and to provide a better understanding of the condition which lead to maximum profitability of the plant, Abstract].

Keyes does not teach a water conveyance system.

Toelle teaches a method with steps of preprogramming a memory with a look-up table of optimal values and reading out the optimal values for controlling the plant [Col. 4, Lines 4 – 29]

Robbat teaches a water conveyance system [cooler, Col. 3, Lines 3 – 4], for the purpose of rapidly cooling the chamber [Col. 3, Line 4].

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **Keyes** to include "a water conveyance system", for the purpose of rapidly cooling the chamber.

Response to Amendment

Claim Rejections - 35 USC § 102

4. Applicants argue the **Keyes** reference is used in "real time", away from applicants' invention. New reference **Toelle** has been cited for providing a control look-up table to be

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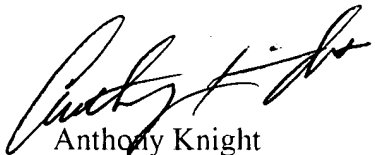
combined with **Keyes** to form a new set of 103 rejections. Former 102 rejections have been withdrawn.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sunray Chang whose telephone number is (571) 272-3682. The examiner can normally be reached on M-F 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on (571) 272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-746-3506.



Anthony Knight
Supervisory Primary Examiner
Group Art Unit 2121
Technology Center 2100
U.S. Patent and Trademark Office

July 7, 2006